

In the Claims:

1. - 7. Cancelled

8. (Previously Presented) In a method of affecting cleaning to remove AlF_3 residue from walls of a reactor chamber, the method comprising the steps of:

a) identifying process conditions that maximize H-atom concentration in a plasma of a gas mixture containing H_2 and Ar using optical emission spectroscopy to identify the H atom concentration in the plasma based on the relative emission intensity from excited H and Ar atoms by the formula:

$$\frac{\text{intensity of H}}{\text{intensity of Ar}} \sim \text{H atom concentration.}$$

b) subjecting said reactor chamber in situ to H_2 gas or a gas mixture of He/ H_2 according to the process conditions identified in step a) without opening said chamber and without shutting down said chamber to affect reduction and removal of said AlF_3 residue.

9. Cancelled

10. (Currently Amended) A method of cleaning a chamber, the method comprising:
- determining cleaning process conditions that maximizes H atom concentration in the chamber;
- injecting into the chamber a first ~~plasma~~ gas mixture in accordance with striking process conditions;
- striking the first ~~plasma~~ gas mixture, thereby creating a first plasma; and
- injecting into the chamber a second ~~plasma~~ gas mixture in accordance with the cleaning process conditions,
- wherein the cleaning process conditions are different than the striking process conditions.
11. (Previously Presented) The method of claim 10, wherein the cleaning process conditions includes one or more of a flow rate, a pressure, and an RF power.
12. (Currently Amended) The method of claim 10, wherein the step of striking ~~a first plasma~~ the first gas mixture is performed at a flow rate of about 1,000/200 sccm, at a pressure of about 0.8 Torr, and at an RF power of about 750 W for about 5 seconds.
13. (Previously Presented) The method of claim 10, wherein the chamber remains closed.
14. (Previously Presented) The method of claim 10, wherein the cleaning process conditions are determined to be a flow rate of about 500 sccm, an RF power of about 500 W, and a pressure of about 0.5 Torr.

15. (Previously Presented) The method of claim 10, wherein the step of determining cleaning process conditions is performed by using optical emission spectroscopy with an Ar tracer to determine the H atom concentration, the H atom concentration being determined by the formula:

$$\frac{\text{intensity of H}}{\text{intensity of Ar}} \sim \text{H atom concentration.}$$

16. (Currently Amended) The method of claim 10 wherein the first ~~plasma is selected from the group consisting of H₂ and He/H₂~~ gas mixture comprises a mixture of He and H₂.

17. (Currently Amended) The method of claim 10 wherein the first ~~plasma is selected from the group consisting of H₂ and Ar/H₂~~ second gas mixture comprises a mixture of Ar and H₂.